

**REMARKS**

Favorable reconsideration is respectfully requested in view of the foregoing amendments and the following remarks.

**I. CLAIM STATUS AND AMENDMENTS**

Claims 1, 3-5, 9-11, 13-14 and 22-28 were pending when last examined. Claims 2, 6-8, 12 and 15-21 were previously canceled. Claims 1, 3-5, 9-11, 13 and 26-27 have been amended, new claims 29-32 have been added, and claims 14, 22-25, and 28 have been cancelled. Claims 26 and 27 have been withdrawn.

Support for the amended and new claims can be found in the specification and original claims as filed. Support can be found, for example, at least in paragraphs [0030], [0034] and [0036], and in Examples 1 and 5 of the specification. No new matter has been added.

Applicants gratefully acknowledge the consideration and helpful suggestions provided to Applicants' representative during the July 6, 2009, Examiner interview.

**II. RESTRICTION**

At page 2, the Office Action requires restriction between Group I: 1, 3-5, 9-11, 13-14, 22-25 and 28, drawn to an ion conductor, and Group II: claims 26 and 27, drawn to a fuel cell, secondary battery, electric double layer capacitor

or electrolytic capacitor comprising and ion conductor. Since Applicants have received an action on the merits, the claims of Group I have been constructively elected by original presentation for prosecution on the merits; thus, claims 26-27 have been withdrawn. Applicants respectfully traverse the restriction requirement.

The claims of Groups I and II relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the claims include the same or corresponding technical features. The technical feature linking Groups I and II is an ion conductor comprising an acid-base mixture, the mixture comprising a base component and an acid component, wherein the base component comprises 2-ethyl-4-methylimidazole and 4-methylimidazole, and optionally 2-ethylimidazole. As further detailed in the remarks below, this feature defines a contribution over the prior art. Specifically, WARREN, and/or OLSON fail to teach or suggest an ion conductor as currently recited in the claims of Groups I and II.

For these reasons, Applicants request reconsideration and withdrawal of the restriction requirement, and request examination of all of the claims in their full scope.

### **III. CLAIM REJECTIONS - 35 USC § 102**

At page 3, the Office Action rejects claims 14, 22, 23 and 25 under 35 U.S.C. § 102(b) as anticipated by WARREN (US Pat. No. 3,356,645). Applicants respectfully traverse the rejection.

Claims 14, 22, 23 and 25 have been cancelled, without prejudice, thus rendering moot this rejection. Thus, Applicants request reconsideration and withdrawal of the rejection.

### **IV. CLAIM REJECTIONS - 35 USC § 103**

At page 4, the Office Action rejects claims 1, 3-5, 9-11, and 13 under 35 U.S.C. § 103(a) as obvious over WARREN, in view of OLSON (US Pat. No. 5,508,328). At page 6, the Office Action also rejects claims 24 and 28 as obvious over WARREN and OLSON. Applicants respectfully traverse these rejections.

Currently amended claim 1 is directed to an ion conductor comprising an acid-base mixture, the mixture comprising a base component and an acid component, wherein the base component comprises 2-ethyl-4-methylimidazole and 4-methylimidazole, and optionally 2-ethylimidazole, and the acid-base mixture is ion conductive and has an ion conductivity of  $10^{-4}$  Scm<sup>-1</sup> or higher at 100°C. WARREN and OLSON fail to teach or suggest such an ion conductor.

Both WARREN and OLSON relate to a curing agent for epoxy resins. WARREN describes curing agents comprising imidazole salts such as 2-ethyl-4-methylimidazole. OLSON describes imidazole curing agents such as 4-methylimidazole. The Office Action holds the position that one of ordinary skill would have found it obvious to combine the 2-ethyl-4-methylimidazole salt of WARREN with the 4-methylimidazole salt of OLSON, to produce the instantly claimed ion conductor mixture, because both compounds are known individually to be effective curing agents for epoxy resins. Applicants respectfully disagree with this conclusion.

First, both WARREN and OLSON relate to a curing agent for epoxy resins. The MPEP provides that "It is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." *In re Kerkhoven*, 205 USPQ 1069, 1072 (CCPA 1980) (emphasis added). Importantly, the MPEP distinguishes that combining equivalents can be considered obvious only when they are used to form a composition used for the same purpose. In this instance, WARREN and OLSON describe imidazole salts and their combination as curing agents for epoxy resins. Thus, the Office Action cannot apply the combination of 2-ethyl-4-

methylimidazole and 4-methylimidazole used as curing agents to establish a *prima facie* case of obviousness in regard to an ion conductor comprising an acid-base mixture, as featured in the instant claims.

Second, the ion conductor of amended claim 1 features an acid-base mixture that has an ion conductivity of  $10^{-4}$  Scm<sup>-1</sup> or higher at 100°C. WARREN and OLSON fail to teach or suggest that the combination of two curing agents for epoxy resins would have any influence on ion conductivity properties. The Office Action holds the position that 2-ethyl-4-methylimidazole and 4-methylimidazole are equivalents, but also that the claimed physical properties would inherently be achieved by the composition as claimed. Applicants respectfully disagree.

Applicants determined that the combination of 2-ethyl-4-methylimidazole and 4-methylimidazole, and optionally 2-ethylimidazole, in an acid-base mixture, produce an ion conductor having superior properties that would not have been expected to one of ordinary skill in the art. Applicants demonstrated in the specification that 2-ethyl-4-methylimidazole and 4-methylimidazole are not mere equivalents in regard to providing for ion conductivity and melting temperature properties.

Example 1 in the specification (paragraph [0041]) details a mixture of 2-ethyl-4-methylimidazole and 4-

methylimidazole and sulfuric acid (molar ratio 1:1:2), as within the scope of claim 1. Example 2 in the specification (paragraph [0042]) details a mixture of 2-ethyl-4-methylimidazole and 2-ethylimidazole. Comparative Example 1 (paragraph [0066]) includes a mixture of 2-ethylimidazole and sulfuric acid (molar ratio 1:1).

Example 1 showed no melting point and a Tg of -54°C; Example 2, no melting point and a Tg of -61°C; and Comparative Example 1, a melting point of 50°C and a Tg of -64°C. Moreover, as shown in Fig. 1, Example 1 and Example 2 also demonstrated higher ion conductivity compared to Comparative Example 1. Example 1 and Example 2 also demonstrated an ion conductivity of  $10^{-4}$  Scm<sup>-1</sup> or higher at 100°C, as within the scope of claim 1. One of ordinary skill in the art would not have predicted, based on the resin curing agent teachings of WARREN and OLSON, that an ion conductor comprising 2-ethyl-4-methylimidazole and 4-methylimidazole, and optionally 2-ethylimidazole, and an acid component, would have these unexpected properties, and in particular, an ion conductivity of  $10^{-4}$  Scm<sup>-1</sup> or higher at 100°C as recited in claim 1.

For at least these reasons, WARREN and OLSON, alone or in combination, fail to teach or suggest and would not have rendered obvious the ion conductor of claim 1, and claims 3-5, 9-11 and 13 dependent on claim 1. Claims 24 and 28 are cancelled, thus rendering moot their rejection. Accordingly,

Applicants request reconsideration and withdrawal of the rejection.

#### **V. NEW CLAIMS 29-32**

New claims 29-32 are directed to additional embodiments of the claimed ion conductor. Each of claims 29-32 depend from claim 1, and for at least the reasons detailed in the above remarks, WARREN and OLSON, alone or in combination, would also fail to teach or suggest, and would not have rendered obvious, new claims 29-32.

#### **VI. CONCLUSION**

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is in condition for allowance and early notice to that effect is hereby requested.

If the Examiner has any comments or proposals for expediting prosecution, please contact the undersigned attorney at the telephone number below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

YOUNG & THOMPSON

/H. James Voeller/

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H. James Voeller, Reg. No. 48,015  
209 Madison Street, Suite 500  
Alexandria, VA 22314  
Telephone (703) 521-2297  
Telefax (703) 685-0573  
(703) 979-4709

HJV/dp